MATERIALS SCIENCE COLLOQUIUM

SPEAKER: Dr. Igor Mazin
US Naval Research Laboratory

TITLE: Superconductivity in Double-layered Oxides: Comparative Analysis in SrRuO4 and NaxCoO2

DATE: Thursday, August 18, 2005

TIME: 11:00 a.m.

PLACE: Building 212, Room A157

HOST: Maria Iavarone

Refreshments will be served at 10:45 a.m.

Abstract: NaxCoO2 arguably holds the record for the number of different superconducting symmetries proposed for one compound. Besides, its behavior in the normal state, particularly magnetic properties and absence of visible manifestation of Hubbard correlations, is totally counterintuitive. In this talk I will discuss the experimental and theoretical situation regarding the electronic properties of parent and hydrated NaxCoO2 materials, both magnetic and uperconducting. I will emphasize the following issues: (1) Are relevant correlations Hubbard-like ("LDA+U") or related to critical magnetic fluctuations? (2) What is the role of magnetic fluctuations in superconductivity and which superconducting symmetries are consistent with the limited knowledge we have from the experiment and from theoretical considerations (3) What determines the magnetic ordering in the parent compound?